

What is claimed is:

1. A continuous process for producing a breathable foam comprising:
5 mixing at least one thermoplastic polymer with at least one blowing agent
to form a foamable solution.
feeding the foamable solution into a shaping orifice.
causing the foamable solution to form a foam material having at least one
major surface at or about the time it exits the shaping orifice, and
10 uniaxially drawing the foam at a rate such that at least one foam cell
ruptures at or about the time the cell exits the shaping orifice, and wherein the resulting
foam is porous in a direction perpendicular to a major surface of the foam.
2. The method of claim 1 wherein the blowing agent is a chemical blowing
15 agent.
3. The method of claim 1 wherein the shaping orifice is a flat film die.
4. The method of claim 1 wherein the thermoplastic polymer is an amorphous
20 polymer.
5. The method of claim 1 wherein the thermoplastic polymer is an elastomer
or thermoplastic elastomer.
- 25 6. The method of claim 5 wherein the thermoplastic polymer has a glass
transition temperature less than 20°C.
7. The method of claim 1 wherein the uniaxial draw rate is chosen to provide
the resulting foam article with an MVTR of at least 300 grams per square meter per 24
30 hours.

8. The method of claim 1 wherein the uniaxial drawing anisotropically orients the foam such that the foam is significantly more elastic in the cross-web direction than in the machine direction.

5 9. The method of claim 1 further comprising stretching the breathable foam in one or more directions after it has cooled to ambient temperature.

10 10. The method of claim 1 further comprising affixing a material onto at least one major surface of the foam.

11. The method of claim 10 wherein the material is affixed by extrusion lamination.

15 12. The method of claim 11 wherein the laminated material is selected from the group consisting of barrier materials, release materials, nonwoven materials, woven materials, and pressure sensitive adhesive materials.

20 13. An article comprising a breathable foam layer, the layer comprising an amorphous polymer, the foam layer further having at least one major surface and having porosity in a direction perpendicular to a major surface.

14. The article of claim 13 wherein the amorphous polymer has a glass transition temperature of less than 20°C.

25 15. The article of claim 13 having at least two layers.

16. The article of claim 15 comprising at least one non-porous layer.

30 17. ~~The article of claim 13, the porosity of which may be increased during use by stretching, and which article can recover at least 50% of such increase in porosity upon release from stretching.~~

18. A continuous process for making a multi-layer structure containing breathable foam comprising:

mixing at least one thermoplastic polymer with at least one blowing agent to form a foamable solution.

5 separately feeding the foamable solution and one or more additional thermoplastic materials into a shaping orifice whereby the foamable solution forms at least one layer and the additional thermoplastic material forms at least one layer of a multi-layered structure having at least one major surface.

10 causing the foamable solution to form a foam at or about the time it exits the shaping orifice, and

uniaxially drawing the multi-layer structure at a rate such that at least one foam cell ruptures at or about the time the cell exits the shaping orifice, and wherein the resulting multi-layer structure is porous in a direction perpendicular to a major surface of the multi-layer structure.

15 19. The method of claim 18 wherein the blowing agent is a chemical blowing agent.

20 20. The method of claim 18 wherein the additional thermoplastic material comprises at least one outermost layer in a multi-layer construction.

21. The method of claim 18 wherein the thermoplastic polymer is a thermoplastic elastomer.

25 22. The method of claim 18 wherein the additional thermoplastic material is a semi-crystalline polymer and the foamable solution comprises an amorphous thermoplastic polymer.

30 23. The method of claim 18 wherein the additional thermoplastic material comprises an amorphous polymer.

24. The method of claim 18 further comprising affixing a material onto at least one major surface of the multi-layer construction.

25. An article comprising at least two layers wherein at least one layer comprises a breathable thermoplastic foam having at least one major surface and having at least one ruptured cell, and wherein the foam layer has porosity in a direction perpendicular to a major surface of the foam and wherein a second layer comprises a polymeric material.

26. The article of claim 25 wherein the second layer is melt-bonded to a major surface of the foam layer.

27. The article of claim 25 wherein the second layer comprises an unfoamed material.

28. The article of claim 25 wherein the foam layer comprises a thermoplastic elastomer.

29. The article of claim 25 comprising a three layer ABA structure, wherein the B layer is a breathable thermoplastic amorphous foam and the A layers comprise an unfoamed material.

30. The article of claim 29 wherein the B layer is a thermoplastic elastomer.

31. The article of claim 25 having a moisture vapor transmission rate greater than 300 grams per square meter per 24 hours.

32. The article of claim 25 further comprising a pressure sensitive adhesive layer affixed to a major surface of an A layer.

33. The article of claim 29 further comprising a material laminated to at least one A layer.